

REMARKS

In view of the above amendment and the following remarks, Applicant requests reconsideration of this application.

Claims 30-68 are pending in this case, with claims 10, 19, 28, 37 and 53 being the pending independent claims.

Applicant has amended all of the pending claims to renumber them as reflected by the Office Action dated October 11, 2001.

Rejections under 35 U.S.C. § 102

The Examiner has rejected claims 10, 14, 15, 23, 24, 28, 32, 33, 37, 41, 42, 46, 48, 49, 53, 57, 58, 62, 64 and 65 under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 5,708,428 issued to Phillips. Applicant respectfully traverses this rejection because, as discussed below, Phillips does not disclose a keyboard having all of the elements of any these claims.

Without prejudice to Applicant's position that Phillips does not anticipate any of the subject claims, Applicant has amended independent claim 37. As discussed below, Phillips does not include all of the limitations of amended claim 37 and claims 38-52, which depend from claim 37.

Claims 10, 14 and 15

Claim 10 recites a keyboard for a computer, which has a plurality of keys, each key including a key structure. A keyboard structure holds the plurality of keys in place relative to one another and defines a space between the key structures of at least two of the plurality of keys. A computer component other than a keyboard component is at least partly disposed in the space between the key structures. As disclosed in Applicant's specification at pages 7-8, a "keyboard component" includes means, for providing sensory output to the user, such as an LED. Thus, claim 10 recites a computer

component, other than an LED that provides for sensory output, disposed in the space between the key structures.

Phillips is directed to a keyboard assembly for a cellular telephone that requires backlighting to illuminate the keyboard in low light and dark conditions. The keyboard assembly includes a translucent keypad 12 having a plurality of keys. An LED component 26 is embedded into the keypad 12 (Fig. 2). When the keyboard is assembled, the LED 26 is disposed in the space between the keys. Significantly, the LED is a “keyboard component” in that it functions to provide backlighting for the keypad (col. 1, line 64 – col. 2, lines 5) and thereby provides a sensory output to the user.

Thus, Phillips discloses only a keyboard component disposed in the space between the key structures. It does not disclose a computer component, which is not a keyboard component, disposed in the space between the key structures. Consequently, Phillips does not anticipate the keyboard of claim 10, and applicant respectfully submits that claim 10 is allowable.

Each of claims 14 and 15 depends from claim 10, and includes all of the limitations of claim 10. As discussed above, Applicant respectfully submits that claim 10 is allowable. Therefore, Applicant also respectfully submits that claims 14 and 15 are allowable.

Claims 23 and 24

Each of claims 23 and 24 depends from claim 19 and includes all of the limitations of claim 19. Claim 19, however, has not been rejected under 35 U.S.C. § 102(b). Therefore, Applicant respectfully submits that claims 23 and 24 also should not be rejected under 35 U.S.C. § 102(b).

Claims 28, 32 and 33

Claim 28 recites a keyboard for a computer having a plurality of keys. Each key of the plurality of keys has a key structure supporting a key cap. The key structures and the key caps define a section key space. The keyboard includes a keyboard structure for holding the plurality of keys in place relative to one another. A computer component other than a keyboard component is at least partly disposed in the section key space.

Phillips does not teach or suggest an apparatus having all of the limitations of claim 28. As discussed above, Phillips does not teach or suggest a computer component other than a keyboard component disposed within a section key space. Therefore, Applicant respectfully submits that claim 28 is allowable.

Each of claims 32 and 33 depends from claim 28, and includes all of the limitations of claim 28. As discussed above, Applicant respectfully submits that claim 28 is allowable. Therefore, Applicant also respectfully submits that claims 32 and 33 are allowable.

Claims 37, 41, 42, 46, 48 and 49

Amended claim 37 recites a keyboard for a computer having a plurality of keys, each key including a key structure and a key cap. The key structures and the key caps of the plurality of keys define a section undepressed key capless key space. The keyboard includes a keyboard structure holding the plurality of keys in place relative to one another. A computer component other than a keyboard component is at least partly disposed in the section undepressed key capless key space and is mounted to a surface facing the plurality of keys. Support for this amendment can be seen in FIGs. 6 and 9.

As discussed above, Phillips does not teach or suggest a computer component other than a keyboard component disposed within a section key space, as recited in claim 37.

Nor does Phillips disclose such a computer component mounted to a surface facing the keys, as recited in amended claim 37. To the contrary, Phillips teaches away from such a structure. Phillips discloses a printed circuit board 16 with a primary side 20 upon which electrical components 18 are mounted. An opposing secondary side 24 of the printed circuit board faces the keypad 12. Electrical components are only mounted to the primary side 20 of the printed circuit board; no electrical components are mounted to the secondary side 24 of the printed circuit board (col. 4, lines 30-40). Although the LED 26 is disposed between the keys, it is not fixed, e.g. by surface mount or soldering, to the printed circuit board 16 and therefore is not mounted to a surface facing the keys, as recited in claim 37. Rather, when the keyboard is assembled, the LED electrical contacts 28 are only pressed into contact with electrical pads 22 on the secondary side 24 of the printed circuit board. Indeed, Phillips teaches that components should not be mounted to a conductor disposed between the keys and the inner surface of the printed circuit board. As Phillips states, “the printed circuit board 16 preferably has all electrical components, represented by the number 18 in the drawings, attached, as by soldering or surface-mount techniques to only the primary side 20 of the PCB 16” (col. 4, line 30-34), which side faces away from the keys. Therefore, Applicant respectfully submits that claim 37 is allowable.

Each of claims 41, 42, 46, 48 and 49 depends from claim 37, and includes all of the limitations of claim 37. As discussed above, Applicant respectfully submits that claim 37 is allowable. Therefore, Applicant also respectfully submits that claims 41, 42, 46, 48 and 49 also are allowable.

Claims 53, 57, 58, 62, 64 and 65

Claim 53 recites a keyboard for a computer that includes a plurality of keys, each key including a key structure and a key cap, and a keyboard structure holding the plurality of keys in place relative to one another. The key structures and the key caps of

the plurality of keys define a bounding key set undepressed key capless space. A computer component other than a keyboard component is at least partly disposed in the bounding key set undepressed key capless space.

Phillips does not teach or suggest an apparatus having all of the limitations of claim 53. As discussed above, Phillips does not teach or suggest a computer component other than a keyboard component disposed within a section key space. Therefore, Applicant respectfully submits that claim 53 is allowable.

Each of claims 57, 58, 62, 64 and 65 depends from claim 53, and includes all of the limitations of claim 53. As discussed above, Applicant respectfully submits that claim 53 is allowable. Therefore, Applicant also respectfully submits that claims 57, 58, 62, 64 and 65 also are allowable.

Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 11-13, 16, 18-22, 25, 27, 29-31, 34, 36, 38-40, 43, 45, 47, 50, 52, 54-56, 59, 61, 63, 66 and 68 under 35 U.S.C. § 103(a) as being unpatentable over Phillips in view of U.S. Pat. No. 6,172,620 B1 issued to Brick et al.

Brick et al. is directed to a portable data terminal with a modular keypad. The keypad module 18 includes a substrate 52 having an array of keys 20 positioned on top of the substrate 52. In the embodiments shown in Figs. 5-9, a cable 92 is connected to the bottom of the substrate 52 and to a separate main circuit board 100, on which is mounted a processor 30 and other circuit components. None of these embodiments show circuit components disposed in the space between the keys 20. In the embodiment, shown in Fig. 9, a keyboard component (keyboard scanning circuit 68) is mounted to the bottom of the substrate 52. This component is not disposed in the space between the keys 20 bounded by the tops of the keys 20 and the bottoms of the keys 20. Moreover, this component is not a processor or other non-keyboard component.

Assuming, for the purposes of argument, that it is proper to combine Phillips and Brick, the combination of those references does not teach or suggest all of the limitations recited in the subject claims. A finding of obviousness requires that all claim limitations of the Applicant's invention must be taught or suggested by the prior art. In re Royka, 180 USPQ 580 (CCPA 1974); MPEP § 2143.03. Here, however, there is no teaching or suggestion whatsoever in Phillips and Brick that teaches utilizing the space between key structures to locate components that are not keyboard components. Nor does the combination of Phillips and Brick teach or suggest such a component mounted to a surface facing the keys.

Claims 11-13, 16 and 18

Each of claims 11-13, 16 and 18 depends from claim 10, and includes all of the limitations of claim 10. As discussed above, Phillips does not teach or suggest all of the limitations of claim 10. Nor does the combination of Phillips and Brick teach or suggest these limitations. All of these claims recite a computer component, other than a keyboard component, that is at least partly disposed in the space between the key structures. In contrast, as discussed above, Phillips and Brick teach away from the subject claim limitations by teaching mounting components that are not keyboard components outside of the space between the key structures. Therefore, Applicant respectfully submits that claims 11-13, 16 and 18 are allowable.

Claims 19-22, 25 and 27

Claim 19 recites a computer system including a central processing unit, output means for outputting data from the computer and a keyboard. The keyboard includes a plurality of keys, each having a key structure. The keyboard also includes a keyboard structure holding the plurality of keys in place relative to one another and defining a space between the key structures of at least two of the plurality of keys. A computer

component other than a keyboard component is at least partly disposed in the space between the key structures. Again, this is in contrast to the keypads of Phillips and Brick, et al., which teach mounting components that are not keyboard components outside of the space between the key structures rather than mounting components within this space. Thus, Applicant respectfully submits that claim 19 is allowable.

Each of claims 20-22, 25 and 27 depends from claim 10, and includes all of the limitations of claim 19. As discussed above, Applicant respectfully submits that claim 19 is allowable. Therefore, Applicant also respectfully submits that claims 21, 22, 25 and 27 also are allowable.

Claims 29-31, 34 and 36

Neither Phillips nor Brick et al. discloses or teaches the keyboard of claims 29-31, 34 and 36. Each of these claims depends from claim 28 and recites a keyboard that includes a plurality of keys and a keyboard structure for holding the plurality of keys in place relative to one another. Each key of the plurality of keys has a key structure supporting a key cap. The key structures and the key caps of the plurality of keys define a section key space, and a computer component, other than a keyboard component, is at least partly disposed in the section key space. Again, this is in contrast to the keypads of Phillips and Brick, et al., which teach mounting components that are not keyboard components outside of the space between the key structures. Therefore, Applicant also respectfully submits that claims 29-31, 34 and 36 are allowable.

Claims 38-40, 43, 45, 47, 50 and 52

Neither Phillips nor Brick et al. discloses or teaches the keyboard of claims 38-40, 43, 45, 47, 50 and 52. Each of these claims depends from claim 37 and recites a keyboard that includes a plurality of keys and a keyboard structure holding the plurality of keys in place relative to one another. Each key includes a key structure and a key cap. The key structures and the key caps of the plurality of keys define a section

undepressed key capless key space. A computer component, other than a keyboard component, is at least partly disposed in the section undepressed key capless key space. In contrast, the keypads of Phillips and Brick, et al., teach mounting components that are not keyboard components outside of the section undepressed key capless key space. Moreover, these electrical components are not mounted to a surface facing the keys, which limitation is included in claims 38-40, 43, 45, 47, 50 and 52. Therefore, Applicant also respectfully submits that claims 38-40, 43, 45, 47, 50 and 52 are allowable.

Claims 54-56, 59, 61, 63, 66 and 68

Applicant further submits that the combination of Phillips and Brick et al. does not disclose or teach the keyboard of claims 54-56, 59, 61, 63, 66 and 68. Each of these claims depends from claim 53 and recites a keyboard having a plurality of keys and a keyboard structure holding the plurality of keys in place relative to one another. Each key includes a key structure and a key cap. The key structures and the key caps of the plurality of keys define a bounding key set undepressed key capless space. A computer component other than a keyboard component is at least partly disposed in the bounding key set undepressed key capless space. In contrast, Phillips and Brick, et al., teach mounting components that are not keyboard components outside of the bounding key set undepressed key capless space. Therefore, Applicant respectfully submits that claims 54-56, 59, 61, 63, 66 and 68 are allowable.

Objections to Claims

The Examiner has objected to the form of each of claims 17, 26, 35, 44, 51, 60 and 67 as being dependent upon a rejected base claim. As discussed above, Applicant respectfully submits that the base claims of all of these claims are allowable, and therefore each of claims 17, 26, 35, 44, 51, 60 and 67 are allowable.

Conclusion

The prior art of record in this matter illustrates that the accepted wisdom for locating computer components other than keyboard components is to locate those parts outside of the space between the key structures of the keyboard. Phillips and Brick et al. are examples that reflect this accepted wisdom; they fail to recognize that locating such components between the keys could provide a solution for reducing the size of the computer. Only Applicant has located such components, contrary to the accepted wisdom, in the space between the key structures of the keyboard. Moreover, Phillips and Brick, et al. teach away from mounting these electrical components to a surface facing the keys. Only the Applicant's disclosure teaches these limitations. It is inappropriate, however, for the Examiner to rely on the benefit of the hindsight vision afforded by the Applicant's disclosure. See Al-Site Corp. v. VSI International, Inc., 50 USPQ2d 1161, 1171 (Fed. Cir. 1999); MPEP § 2142.

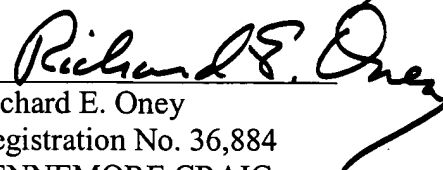
For the foregoing reasons, Applicant submits that the claims 10-68 are neither anticipated by nor obvious in view of the art of record. Applicant therefore requests reconsideration and allowance of these claims.

Attached to this Response and Amendment is a marked-up version of the changes made to the specification by the current amendment. The attached pages are captioned "Version With Markings To Show Changes Made."

The Examiner is invited to telephone the Applicant's undersigned attorney at (602) 916-5303 if this would in any way facilitate prosecution of the application.

Dated: January 17, 2003

Respectfully submitted,

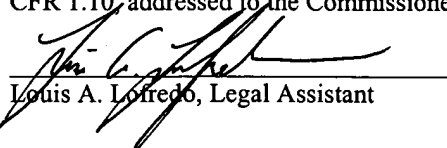


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I hereby certify that this paper and any documents referred to herein are being deposited on the date indicated above with the U.S. Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10, addressed to the Commissioner for Patents, Washington, D.C. 20231.



Louis A. Lofredo, Legal Assistant

1/17/03
Date of Signature

Version With Markings To Show Changes Made

10. (Amended) A keyboard for a computer, the keyboard comprising:
a plurality of keys, each key including a key structure;
a keyboard structure holding the plurality of keys in place relative to one another
and defining a space between the key structures of at least two of the plurality of keys;
and
a computer component other than a keyboard component, the computer
component being at least partly disposed in the space between the key structures.
11. (Amended) The keyboard of claim +10 wherein the computer
component disposed between the key structures includes power means for providing
power to the computer.
12. (Amended) The keyboard of claim 211 wherein the power means
comprises a power source.
13. (Amended) The keyboard of claim 211 wherein the power means
comprises power regulation means for regulating power supplied to the computer.
14. (Amended) The keyboard of claim +10 wherein the computer
component disposed between the key structures comprises an integrated circuit.
15. (Amended) The keyboard of claim +10 wherein the computer
component disposed between the key structures comprises a passive component.
16. (Amended) The keyboard of claim +10 wherein the computer
component disposed between the key structures comprises output means for outputting
data from the computer.

17. (Amended) The keyboard of claim ~~7~~16 wherein the output means comprises remote access means for transmitting data to or receiving data from a device that is not physically attached to the computer.

18. (Amended) The keyboard of claim ~~10~~10 wherein the computer component disposed between the key structures comprises storage means for storing data.

19. (Amended) A computer system comprising:
a central processing unit;
output means for outputting data from the computer; and
a keyboard comprising:
a plurality of keys, each key including a key structure;
a keyboard structure holding the plurality of keys in place relative to one another and defining a space between the key structures of at least two of the plurality of keys;
and
a computer component other than a keyboard component, the computer component being at least partly disposed in the space between the key structures.

20. (Amended) The computer system of claim ~~10~~19 wherein the computer component disposed between the key structures includes power means for providing power to the computer.

21. (Amended) The computer system of claim ~~11~~20 wherein the power means comprises a power source.

22. (Amended) The computer system of claim ~~11~~20 wherein the power means comprises power regulation means for regulating power supplied to the computer.

23. (Amended) The computer system of claim ~~10~~19 wherein the computer component disposed between the key structures comprises an integrated circuit.

24. (Amended) The computer system of claim ~~10~~19 wherein the computer component disposed between the key structures comprises a passive component.

25. (Amended) The computer system of claim ~~10~~19 wherein the computer component disposed between the key structures comprises output means for outputting data from the computer.

26. (Amended) The computer system of claim ~~16~~25 wherein the output means comprises remote access means for transmitting data to or receiving data from a device that is not physically attached to the computer.

27. (Amended) The computer system of claim ~~10~~19 wherein the computer component disposed between the key structures comprises storage means for storing data.

28. (Amended) A keyboard for a computer, the keyboard comprising:
a plurality of keys, each key of the plurality of keys having a key structure supporting a key cap, the key structures and the key caps of the plurality of keys defining a section key space;

a keyboard structure for holding the plurality of keys in place relative to one another; and

a computer component other than a keyboard component, the computer component being at least partly disposed in the section key space.

29. (Amended) The keyboard of claim ~~1928~~ wherein the computer component disposed in the section key space includes power means for providing power to the computer.

30. (Amended) The keyboard of claim ~~2029~~ wherein the power means comprises a power source.

31. (Amended) The keyboard of claim ~~2029~~ wherein the power means comprises power regulation means for regulating power supplied to the computer.

32. (Amended) The keyboard of claim ~~1928~~ wherein the computer component disposed in the section key space comprises an integrated circuit.

33. (Amended) The keyboard of claim ~~1928~~ wherein the computer component disposed in the section key space comprises a passive component.

34. (Amended) The keyboard of claim ~~1928~~ wherein the computer component disposed in the section key space comprises output means for outputting data from the computer.

35. (Amended) The keyboard of claim ~~2534~~ wherein the output means comprises remote access means for transmitting data to or receiving data from a device that is not physically attached to the computer.

36. (Amended) The keyboard of claim ~~1928~~ wherein the computer component disposed in the section key space comprises storage means for storing data.

37. (Amended) A keyboard for a computer, the keyboard comprising:
a plurality of keys, each key including a key structure and a key cap, the key structures and the key caps of the plurality of keys defining a section undepressed key capless key space;

a keyboard structure holding the plurality of keys in place relative to one another; and

a computer component other than a keyboard component, the computer component being at least partly disposed in the section undepressed key capless key space and being mounted to a surface facing the plurality of keys.

38. (Amended) The keyboard of claim 2837 wherein the computer component disposed in the section undepressed key capless key space includes power means for providing power to the computer.

39. (Amended) The keyboard of claim 2938 wherein the power means comprises a power source.

40. (Amended) The keyboard of claim 2938 wherein the power means comprises power regulation means for regulating power supplied to the computer.

41. (Amended) The keyboard of claim 2837 wherein the computer component disposed in the section undepressed key capless key space comprises an integrated circuit.

42. (Amended) The keyboard of claim 2837 wherein the computer component disposed in the section undepressed key capless key space comprises a passive component.

43. (Amended) The keyboard of claim 2837 wherein the computer component disposed in the section undepressed key capless key space comprises output means for outputting data from the computer.

44. (Amended) The keyboard of claim 3443 wherein the output means comprises remote access means for transmitting data to or receiving data from a device that is not physically attached to the computer.

45. (Amended) The keyboard of claim 2837 wherein the computer component disposed in the section undepressed key capless key space comprises storage means for storing data.

46. (Amended) The keyboard of claim 28,37, wherein:
the key structures and the key caps of the plurality of keys also define a section undepressed key space; and
the computer component other than a keyboard component is at least partly disposed in the section undepressed key space.

47. (Amended) The keyboard of claim 37 wherein the computer component disposed in the section undepressed key space includes power means for providing power to the computer.

48. (Amended) The keyboard of claim 37 wherein the computer component disposed in the section undepressed key space comprises an integrated circuit.

49. (Amended) The keyboard of claim 37 wherein the computer component disposed in the section undepressed key space comprises a passive component.

50. (Amended) The keyboard of claim 37 wherein the computer component disposed in the section undepressed key space comprises output means for outputting data from the computer.

51. (Amended) The keyboard of claim 41 wherein the output means comprises remote access means for transmitting data to or receiving data from a device that is not physically attached to the computer.

52. (Amended) The keyboard of claim 37 wherein the computer component disposed in the section undepressed key space comprises storage means for storing data.

53. (Amended) A keyboard for a computer, the keyboard comprising:
a plurality of keys, each key including a key structure and a key cap;
a keyboard structure holding the plurality of keys in place relative to one another;

the key structures and the key caps of the plurality of keys defining a bounding key set undepressed key capless space; and

a computer component other than a keyboard component, the computer component being at least partly disposed in the bounding key set undepressed key capless space.

54. (Amended) The keyboard of claim 44~~53~~ wherein the computer component disposed in the bounding key set undepressed key capless space includes power means for providing power to the computer.

55. (Amended) The keyboard of claim 45~~54~~ wherein the power means comprises a power source.

56. (Amended) The keyboard of claim 45~~54~~ wherein the power means comprises power regulation means for regulating power supplied to the computer.

57. (Amended) The keyboard of claim ~~44~~53 wherein the computer component disposed in the bounding key set undepressed key capless space comprises an integrated circuit.

58. (Amended) The keyboard of claim ~~44~~53 wherein the computer component disposed in the bounding key set undepressed key capless space comprises a passive component.

59. (Amended) The keyboard of claim ~~44~~53 wherein the computer component disposed in the bounding key set undepressed key capless space comprises output means for outputting data from the computer.

60. (Amended) The keyboard of claim ~~50~~59 wherein the output means comprises remote access means for transmitting data to or receiving data from a device that is not physically attached to the computer.

61. (Amended) The keyboard of claim ~~44~~53 wherein the computer component disposed in the bounding key set undepressed key capless space comprises storage means for storing data.

62. (Amended) The keyboard of claim ~~44~~53, wherein:

the key structures and the key caps of the plurality of keys also define a bounding key set undepressed key set space; and

the computer component other than a keyboard component is at least partly disposed in the bounding key set undepressed key set space.

63. (Amended) The keyboard of claim ~~53~~62 wherein the computer component disposed in the bounding key set undepressed key set space includes power means for providing power to the computer.

64. (Amended) The keyboard of claim 5362 wherein the computer component disposed in the bounding key set undepressed key set space comprises an integrated circuit.

65. (Amended) The keyboard of claim 5362 wherein the computer component disposed in the bounding key set undepressed key set space comprises a passive component.

66. (Amended) The keyboard of claim 5362 wherein the computer component disposed in the bounding key set undepressed key set space comprises output means for outputting data from the computer.

67. (Amended) The keyboard of claim 5766 wherein the output means comprises remote access means for transmitting data to or receiving data from a device that is not physically attached to the computer.

68. (Amended) The keyboard of claim 5362 wherein the computer component disposed in the bounding key set undepressed key set space comprises storage means for storing data.

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